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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/541,511	03/02/2006	John Robert Owen	P-8053-US	1489

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EXAMINER	
SALZMAN, KOURTNEY R	
ART UNIT	PAPER NUMBER
1795	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/541,511	OWEN ET AL.	
	Examiner	Art Unit	
	KOURTNEY R. SALZMAN	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 October 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,5 and 6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 5 and 6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The amendment filed October 12, 2009 has been entered and fully considered.

2. Claims 2-4 have been cancelled and claim 1 has been amended.

3. Claims 1, 5 and 6 have been examined and fully considered.

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 1, 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over WACHSMAN et al (US PG PUB 2003066519) in view of SULLIVAN et al (Analytical Chemistry, October 1999, 71(19), p. 4369-4375) and KUDLA et al (Kudla, R. J., S. Subramanian, M. S. Chattha, and T. E. Hoost. "Effect of Tungsten Oxide Addition on the Catalytic Activity of Gamma-Al2O3 for NOx Reduction from Fuel-Lean Gas Mixtures." *Ind. Eng. Chem. Res.* 35 (1996): 4394-397.).

Regarding claims 1 and 5, WACHSMAN et al teaches an electrochemical sensor with an electrolyte and first and second electrode where the first electrode has a tungsten oxide layer in paragraphs 11-17 and in figure 1. The oxide layer is known in the art to be electrochromic. The electrolyte will contain the material to be catalyzed when the fuel/gas mixture permeates the electrolyte. There are two materials which function as catalysts present in WACHSMAN et al, as both Au and tungsten oxide are present in the electrode as shown in figure 14.

WACHSMAN et al teaches the electrodes and electrolyte to be commonly electrically connected in figures 1a-1c.

WACHSMAN et al fails to teach a plurality of regions for testing the samples, to explicitly teach the testing of the electrocatalyst in the gas sensor and for the electrocatalyst to be present in both the electrolyte and electrode during testing.

SULLIVAN et al teaches applying multiple electrodes onto one substrate so that the electrochemical response of each of the electrodes can be monitored in figure 1, the "Experimental Section" on p. 4370 and “Automated Direct Electrochemical Analysis” on p. 4373.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to apply multiple regions of testing, as in SULLIVAN et al, to the electrodes with tungsten oxide, as in WACHSMAN et al, because a combinatorial approach to electrode analysis allows a number of different samples, or aspects of the sample, can be tested more or less simultaneously, saving time. This is more relevant to WACHSMAN et al because already teaches the use of multiple electrodes as in figures 1B and 1C and identifies multiple species of nitrogen oxide gas to be of interest and multiple testing areas would allow for concurrent testing of these species.

The combination of WACHSMAN et al and SULLIVAN et al fails to teach the use of the gas sensor for testing the electrocatalyst explicitly and for the electrocatalyst to be present in both the electrolyte and electrode during testing.

KUDLA et al teaches a gas sensor for testing the effects of electrocatalytic loading in the abstract. It is obvious that the electrocatalyst is being tested while a traditional gas sensor is utilized for the structure of the testing, as discussed in the Introduction and Experimental Sections, comprising specifically in the Experimental Section when the oxygen (or the effect of the electrocatalyst) is measured with an oxygen sensor. The electrocatalyst, here the tungsten oxide is also present in the electrolyte as the title and abstract teach.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to utilize the gas sensor of WACHSMAN et al as combined with SULLIVAN et al to test the viability or functionality of an electrocatalyst, as shown by the experimentation of KUDLA et al because KUDLA et al teaches a traditional oxygen sensitive sensor to show the viability of electrocatalytic presence in the electrolyte.

Regarding claim 5, tungsten oxide is identified to be present in the paragraph 19 of WACHSMAN et al and is well known in the art to behave as an electrochromic material.

Regarding claim 6, WACHSMAN et al teaches a reference electrode to be present in figure 1B as reference number 30.

6. Claims 1 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over NAGAI et al (JP Patent Number 6160344 abstract) in view of SULLIVAN et al (Analytical Chemistry, October 1999, 71(19), p. 4369-4375) and KUDLA et al (Kudla, R. J., S. Subramanian, M. S. Chattha, and T. E. Hoost. "Effect of Tungsten Oxide Addition on the Catalytic Activity of Gamma-Al2O3 for NOx Reduction from Fuel-Lean Gas Mixtures." *Ind. Eng. Chem. Res.* 35 (1996): 4394-397.).

NAGAI et al teaches an electrochemical sensor with electrolyte and two electrodes, one of which (the counter electrode) with a tungsten oxide, or electrochromic material, as stated in the abstract. This sensor is for the detection and concentration determining of a gas through the absorbtion of gas molecules. The common detection is also shown in the accompanying figure. The electrolyte will contain the material to be catalyzed when the fuel/gas mixture permeates the electrolyte. There are two materials which function as catalysts present in NAGAI et al, as both Pt electrode and tungsten oxide are present in the electrode as shown in figure 14. NAGAI et al teaches the electrodes and electrolyte to be commonly electrically connected in the figure.

NAGAI et al fails to teach a plurality of regions for testing the samples, to explicitly teach the testing of the electrocatalyst in the gas sensor and for the electrocatalyst to be present in both the electrolyte and electrode during testing.

SULLIVAN et al teaches applying multiple electrodes onto one substrate so that the electrochemical response of each of the electrodes can be monitored in figure 1, the "Experimental Section" on p. 4370 and “Automated Direct Electrochemical Analysis” on p. 4373.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to apply multiple regions of testing, as in SULLIVAN et al, to the electrodes with tungsten oxide, as in NAGAI et al, because a combinatorial approach to electrode analysis allows a number of different samples, or aspects of the sample, can be tested more or less simultaneously, saving time. This is more relevant to NAGAI et al because multiple species of nitrogen oxide gas exist and multiple testing areas would allow for concurrent testing of these species.

The combination of NAGAI et al and SULLIVAN et al fails to teach the use of the gas sensor for testing the electrocatalyst explicitly and for the electrocatalyst to be present in both the electrolyte and electrode during testing.

KUDLA et al teaches a gas sensor for testing the effects of electrocatalytic loading in the abstract. It is obvious that the electrocatalyst is being tested while a traditional gas sensor is utilized for the structure of the testing, as discussed in the Introduction and Experimental Sections, comprising specifically in the Experimental Section when the oxygen (or the effect of the electrocatalyst) is measured with an oxygen sensor. The electrocatalyst, here the tungsten oxide is also present in the electrolyte as the title and abstract teach.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to utilize the gas sensor of NAGAI et al as combined with SULLIVAN et al to test the viability or functionality of an electrocatalyst, as shown by the experimentation of KUDLA et al because KUDLA et al teaches a traditional oxygen sensitive sensor to show the viability of electrocatalytic presence in the electrolyte. The effect of the different catalysts being tested in KUDLA et al is reflected in the oxygen concentrations.

Regarding claim 5, tungsten oxide is identified to be present in the abstract of NAGAI et al and is well known in the art to behave as an electrochromic material.

7. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over NAGAI et al (JP Patent Number 6160344 abstract) in view of SULLIVAN et al (Analytical Chemistry, October 1999, 71(19), p. 4369-4375) and KUDLA et al (Kudla, R. J., S. Subramanian, M. S. Chattha, and T. E. Hoost. "Effect of Tungsten Oxide Addition on the

Catalytic Activity of Gamma-Al2O3 for NOx Reduction from Fuel-Lean Gas Mixtures." *Ind. Eng. Chem. Res.* 35 (1996): 4394-397.), as applied above to claim 1 and in further view of WACHSMAN et al (US PG PUB 2003/0066519).

The combination of references NAGAI et al, SULLIVAN et al and KUDLA et al teach all the limitations of claim 1, but fail to teach the use of a reference electrode.

WACHSMAN et al teaches an electrochemical cell with a reference electrode in paragraph 75 and in figure 1B as reference number 30.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to include a reference electrode as in WACHSMAN et al in the sensor of NAGAI et al, SULLIVAN et al and KUDLA et al because as stated in paragraph 75 of WACHSMAN et al it will allow for an absolute voltage reading for the electrodes instead of relative values.

Response to Arguments

8. Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection. The new grounds of rejection are deemed necessary by the addition of not only the new limitations (in the change of scope of all being present not the alternative interpretation provided by the previous presentation) but also by the removal of some limitations (as in for the first electrode and electrolyte to have the electrocatalyst present, while previously this was an alternative phrase which

did not require both at the same time). Furthermore, the addition of KUDLA et al is to reflect these amendments and address their usage. The previous wording of the claims did not require the presence of the sample electrocatalyst to be present in the way of the newly worded claim 1, therefore this action is made final and another reason for the incorporation of reference KUDLA et al.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KOURTNEY R. SALZMAN whose telephone number is (571)270-5117. The examiner can normally be reached on Monday to Thursday 6:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nam X Nguyen/
Supervisory Patent Examiner, Art Unit 1753

krs
1/29/2010